UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

UNITED STATES OF AMERICA

- against -

KALEIL ISAZA TUZMAN,

Defendant.

MEMORANDUM
OPINION & ORDER

15 Cr. 536 (PGG)

PAUL G. GARDEPHE, U.S.D.J.:

Defendant Kaleil Tuzman – the former chief executive officer of KIT digital, Inc. – is charged with conspiracy to commit securities fraud and wire fraud between December 2008 and April 2012. (S8 Indictment (Dkt. No.198)) A jury was selected during the week of October 23, 2017, the presentation of evidence began on October 30, 2017, and trial has continued since that time.

In Count Six of the S8 Indictment, Tuzman is charged with conspiring to commit securities fraud, make false statements in SEC reports, and make false statements to KIT digital's auditors. (Id. ¶¶ 83-143) The Government contends that Tuzman, Robin Smyth – the former chief financial officer of KIT digital – and Gavin Campion – KIT digital's former president – conspired to commit accounting fraud through a series of "round-tripping" transactions that involved sham license agreements entered into with shell entities. (Id. ¶¶ 7-8, 96-97) According to the Government, Tuzman, Smyth, and Campion used the sham licenses and round-tripping transactions with shell entities to fraudulently inflate KIT digital's revenue. (Id. ¶¶ 99-136) The Government also contends that Tuzman conspired with others to deceive KIT digital's auditors and investors by misrepresenting the status of KIT digital's investment in Enable Invest, a Dubai-based investment firm. (Id. ¶¶ 3, 98, 137)

Both Smyth and Campion pleaded guilty to conspiracy to commit securities fraud and securities fraud, entered into cooperation agreements with the Government, and testified at trial. (Trial Transcript ("Tr.") at 2254, 2274, 3897-98) At trial, Smyth testified that he made contemporaneous notes in certain notebooks between 2008 and 2012 (id. at 2267-69, 2323-28, 2365, 2508, 2553, 2565), during the accounting fraud conspiracy charged in Count Six. Certain of Smyth's notes have been introduced by the Government at trial. (See GX 2188-B, GX 2188-C, GX 2189-CR, GX 2190-B, GX 2190-C, GX 2190-AR, and GX 2192-C)

Tuzman claims that certain of the entries in Smyth's notebooks were not made contemporaneously between 2008 and 2012, but were instead added to the notebooks at some point between 2015 and 2017, after Smyth came under investigation. (Tuzman Opp. (Dkt. No. 575) at 7, 9) Tuzman intends to call Dr. Albert H. Lyter III, a forensic chemist, to testify that certain of Smyth's notebook entries were not written between 2008 and 2012, but were instead added at some point between 2015 and 2017. (Id.)

On November 20, 2017, the Court conducted a Daubert hearing regarding Dr. Lyter's proposed testimony. Dr. Lyter testified that he performed (1) a physical examination of the notebook entries; (2) a Thin Layer Chromatography test of the ink used to make the entries, which is designed to determine whether the same ink was used to make the entries; and (3) Solvent Loss Ratio Method ("SLRM") analysis using Gas Chromatography/Mass Spectrometry ("GC/MS") testing, which is designed to date the use of the ink. (See Tr. at 2819-20, 2834-38, 2844-46) According to Dr. Lyter, SLRM analysis is a "specific application" of GC/MS testing (id. at 2892), that "involves using GC/MS to analyze for semivolatile components [of ink], particularly [] 2-phenoxyethanol." (Id. at 2812) After performing the examination and tests mentioned above, Dr. Lyter concluded that eight entries in Smyth's notebooks were not made

between 2008 and 2012, but instead were written between 2015 and 2017. (See id. at 3041-42) Two of the eight entries challenged by Dr. Lyter were introduced by the Government as GX 2188-B and GX 2188-C.

The Government seeks to preclude Dr. Lyter from testifying about the SLRM analysis he performed using GC/MS testing. (Gov't Br. (Dkt. No. 572)) As an initial matter, the Government contends that Tuzman "did not satisfy his [Federal Rule of Criminal Procedure] 16 disclosure obligations" because Tuzman's August 21, 2017 disclosures did not supply the bases and reasons for Dr. Lyter's opinions. (Id. at 3; see also Sept. 8, 2017 Gov't Ltr. (Dkt. No. 417) at 2-3) The Government also argues that Tuzman "has failed to establish that (a) Dr. Lyter is qualified as an expert in SLRM using GC/MS analysis, or (b) that the bespoke method of SLRM using GC/MS analysis he performed is reliable." (Gov't Br. (Dkt. No. 572) at 1) The Government also argues that – as to the two notebook entries introduced at trial that Dr. Lyter has challenged – "Dr. Lyter's testing results – when properly analyzed – do not even support his conclusion that Smyth created those documents between 2015 and 2017." (Id.)

For the reasons stated below, this Court concludes that (1) Tuzman's initial disclosures were deficient under Federal Rule of Criminal Procedure 16, but that preclusion of Dr. Lyter's testimony is not warranted on this ground; (2) Dr. Lyter's proffered testimony is not sufficiently reliable for admission under Federal Rule of Evidence 702; and (3) Dr. Lyter's proffered testimony is properly excluded under Federal Rule of Evidence 403 as more prejudicial than probative. Accordingly, the Government's motion to preclude Dr. Lyter from testifying about his SLRM analysis will be granted.

BACKGROUND

I. THE SMYTH NOTEBOOK PAGES INTRODUCED AT TRIAL

Smyth's notebooks, which are marked as GX 2188, GX 2189, GX 2190, GX 2191, and GX 2192, contain more than 500 pages of handwritten notes. The Government has introduced seven entries from the Smyth notebooks into evidence. (GX 2188-B; GX 2188-C; GX 2189-CR; GX 2190-B; GX 2190-C; GX 2190-AR; and GX 2192-C) Tuzman contends that two of these exhibits – GX 2188-B and GX 2188-C – contain ink that was not applied to paper contemporaneously with the alleged accounting fraud conspiracy, but was instead first applied to paper during the 2015 to 2017 time period. (Tuzman Opp. (Dkt. No. 575) at 7, 9)

The notebook page marked as GX 2188-B contains a handwritten flow chart that Smyth testified portrays proposed fraudulent round-tripping transactions.[1] (Tr. at 2324) In the unredacted version of GX 2188-B – which is marked as GX 2188-A – "Kaliel Said Great Idea!" is handwritten above the flow chart. (Id. at 1993, 2179-80; GX 2188-A)

At trial, Tuzman argued that the "Great Idea" note should be precluded as hearsay (Tr. at 2181-82), while the Government argued that the "Great Idea" note was admissible as a co-conspirator statement and as a prior consistent statement. (Id. at 2179-2184) The Court ruled that the Government had not articulated a theory on which Smyth's "Great Idea" note furthered the charged conspiracy, however, and that the general attacks on Smyth's credibility in the defense openings were not sufficient to permit introduction of the "Great Idea" note as a prior consistent statement. (See id. at 2186-2190) As to the latter point, the Court noted that it would not become clear – until defense counsel's cross-examination of Smyth – whether counsel would challenge Smyth's testimony that Tuzman said "Great Idea" when Smyth suggested the round-

[1] None of the Smyth notebook pages introduced at trial is dated.

tripping fraud as a way to inflate KIT digital's revenue. (Id. at 2188-89) Accordingly, the Court ordered that GX 2188-A be redacted to eliminate the phrase, "Kaleil Said Great Idea!" (See id. at 2215-16) Because Defendants have not challenged Smyth's account of Tuzman's reaction to Smyth's round-tripping idea, the unredacted version of GX 2188-B has not been admitted and the jury has not seen Smyth's "Great Idea" note. (Id. at 3506)

The Smyth notebook pages marked as GX 2188-C contain a list of items that Smyth testified he wanted to discuss with Tuzman, including the Enable investment and KIT digital's relationship with Tomas Petru, an alleged co-conspirator who was assisting Tuzman, Smyth, and Campion in committing the round-tripping fraud. (Id. at 2263, 2363-64; GX 2188-C) Smyth's note states that Petru "has to realise that there is value in what we are giving him. Need to work out what real value is. (Blackmail!) rip money out." (GX 2188-C) Smyth testified that Petru "organized some fake transctions" for KIT digital and received "some of the cash to round trip back into the company. And he also bought a company – the company he sold KIT digital, which had a lot of uncollectible revenue in it to remove it from KIT digital." (Tr. at 2263) Smyth testified that his note referred to the fact that KIT was "transferring back the company to T[]omas Petru, and although there were toxic assets in the company and uncollectible revenue, there was value in the company as well. . . . I believe he was using the situation that we needed to [get] rid [of] the company to, yes, force us to pay him more money." (Id. at 2365)

The other Smyth notebook pages introduced by the Government – which Tuzman has not claimed are fabricated – address the following: The notebook page marked as GX 2189-CR states, "if K [Tuzman] leaves as CEO that is day I leave as CFO. I am not signing as only person who knows of BE. One alternative is to tell everyone we have been BE'ing which we

have run out of options." (GX 2189-CR) Smyth testified that BE referred to the "back end," which was a code name that he and Tuzman used to refer to their accounting fraud scheme. (Tr. at 2256, 2566) Smyth further testified that his reference to "not signing" was to not signing KIT digital's Form 10-K. (Id. at 2566) When GX 2189-CR was introduced, the Court instructed the jury that it was "being offered not for the truth of any of the statements in it but rather to the extent that you find it sheds light on Mr. Smyth's state of mind." (Id. at 2565-66)

The notebook pages marked as GX 2190-B and GX 2190-C are lists "of issues and things [Smyth testified that he] wanted to discuss with [Tuzman]," including "B.E.," "[w]e are freaking out people," and "we are now bringing too many people into it." (Id. at 2505; GX 2190-B; GX 2190-C) The notebook page marked as GX 2190-AR reflects, inter alia, Smyth's belief that the "$10M Lat Am Acquisition . . . cannot be done as the only way it works is if it does not hit the [profit and loss statement of KIT digital] and [the balance sheet]. The auditors will not accept it if they know. That can only happen if we are dealing with people who know what we are doing is not kosher, or they are dumb." (GX 2190-AR; Tr. at 2553) When GX 2190-AR was introduced, the Court instructed the jury that it was being offered only to show Smyth's state of mind. (Tr. at 2555)

The notebook page marked as GX 2192-C contains a record of "fake licenses" that Smyth "and others had created," "the dates that payments were due against those licenses," and the amounts due.[2] (GX 2192-C; Tr. at 2402)

[2] Tuzman has introduced three additional pages from Smyth's notebooks. (KIT Ex. 4765; KIT Ex. 4767; KIT Ex. 4768) He intends to argue that the handwriting on these pages appears to be in a different hand. (Tr. at 3772-75)

II. TUZMAN'S DISCLOSURES PRIOR TO THE *DAUBERT* HEARING

On August 10, 2017, the Court ordered that "disclosure for any expert intended to offer testimony on ink or authenticity issues" be filed by August 21, 2017. (Dkt. No. 361) On August 21, 2017, Tuzman disclosed to the Government Dr. Lyter's qualifications, a description of the three types of tests and analyses he performed, and a one-paragraph summary of his conclusions. (KIT Ex. 10003) Although Tuzman's disclosures at this time do not reference SLRM analysis – as discussed below – it became clear shortly before trial that the paragraph set forth below addresses Dr. Lyter's SLRM analysis using GC/MS testing:

> Dr. Lyter also performed a chemical examination on the notebooks using the Gas Chromatography/Mass Spectrometry ("GC/MS") methodology, which allows analysis of complex mixtures for purposes of ink dating, i.e., determining the date or time period during which the writing occurred in the examined documents. Dr. Lyter will testify that GC/MS is used to separate complex mixtures and identify the components by their retention time (i.e., how long the component takes to go through a column), and mass spectra (i.e., the components' molecular weight or the weight of fragments of the components). GC/MS is used routinely in forensic and clinical laboratories worldwide for the analysis of drugs, explosive residue, accelerant detection, and trace evidence such as fibers and paint, but is also widely applied to writing-ink analysis, whereby a particular component that is present in a large percentage of ball-pen ink formulations (2-phenoxyethanol ("PE")) is studied. Dr. Lyter will testify that research has established that levels of PE decrease with time after application of ball-pen ink to paper until a point of equilibrium is reached no later than 2 years after application of the ink to paper.
>
> Using the same micro plug technique summarized above for obtaining samples used in the TLC methodology,[3] he performed the GC/MS analysis on 21 different areas of writing in the examined documents.

(Id. at 5-6)

Tuzman's disclosures state that Dr. Lyter will testify that he reached the following conclusions:

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[3] According to Tuzman's disclosures at this time, the micro plug technique involves "removing small portions of the pages by means of a hypodermic-needle-sized hole punch (0.5mm in diameter) to produce micro plugs containing ink and paper." (KIT Ex. 10003 at 5)

> The levels of PE analyzed in nine (9) different written entries is inconsistent with the preparation of these entries during the timeframe represented as the purported dates of preparation of the documents, i.e., contemporaneous to events at KIT Digital (and long prior to 2015). To the contrary, chemical examination of the entries on documents bearing bates stamps 17821, 17915, 17541, 17633, 17829, 17867, 17415, 17628, and 17709 indicate preparation within the 2 years prior to his February 2017 examination (i.e., after February 2015). These results are inconsistent with preparation of those nine entries between 2008 and 2012, when the purported author of the notebooks was employed at KIT Digital.

(Id. at 6) Tuzman did not produce an expert report from Dr. Lyter. (See id.; Sept. 5, 2017 Tuzman Ltr. (Dkt. No. 392) at 2)

The Government objected that Tuzman's disclosures were insufficient. Tuzman then provided an academic paper written by Marc Gaudreau and Luc Brazeau (the "Gaudreau & Brazeau paper") describing the SLRM analysis utilized by Dr. Lyter. (KIT Ex. 10000 at 1-32) Tuzman also produced the results of the 9 GC/MS SLRM tests that Dr. Lyter intended to address at trial. (Id. at 33-76) Tuzman did not provide the results from twelve other GC/MS SLRM tests that Dr. Lyter performed on Smyth notebook pages.

On September 1, 2017, the Government moved to compel Tuzman to comply with his Fed. R. Crim. P. 16 disclosure obligations with respect to Dr. Lyter. (Sept. 1, 2017 Gov't Ltr. (Dkt. No. 387)) The Government argued that Rule 16(b)(1)(B) required Tuzman to disclose the results of the other tests that Dr. Lyter had conducted. (Id. at 5) The Government also argued that Dr. Lyter should be required to "explain what the PE level was [for] each test, why that level is inconsistent with the creation date between 2008 and 2012, and the basis and reasons for these opinions," pursuant to Rule 16(b)(1)(C). (Sept. 8, 2017 Gov't Ltr. (Dkt. No. 417) at 3) The Government contended that, "[t]o the extent that defendant continues to ignore his disclosure obligations, . . . he should be precluded from calling [D]r. Lyter as a witness." (Sept. 1, 2017 Gov't Ltr. (Dkt. No. 387) at 1)

In his September 5, 2017 opposition to the Government's motion to compel, Tuzman stated that Dr. Lyter "did not prepare 'reports' of his scientific tests on the notebooks," and argued that "Rule 16 manifestly does not impose any obligation to prepare such a report." (Sept. 5, 2017 Tuzman Ltr. (Dkt. No. 392) at 2) Tuzman also contended that the text of Rule 16(b)(1)(B) only requires disclosure of results not testified to if a report is prepared, that he had "appropriately produced only those 'results' of Dr. Lyter's [GC/MS] tests associated with [the] nine entries that will be the focus of Dr. Lyter's testimony," and that the Thin Layer Chromatography tests did not produce "results" but rather only "intermediate laboratory material" not subject to disclosure. (Id. at 2-3) Tuzman also argued that his August 21, 2017 disclosures were sufficient under Rule 16(b)(1)(C). (Id. at 1)

On October 2, 2017 – while its motion to compel was pending – the Government moved for a Daubert hearing concerning Dr. Lyter's proffered testimony. (Oct. 2, 2017 Gov't Ltr. (Dkt. No. 464)) The Government complained that Tuzman had made "incredibly selective and legally insufficient disclosures" concerning Dr. Lyter's proposed testimony. (Oct. 22, 2017 Gov't Ltr. (Dkt. No. 511) at 2) The Government further complained that

> [Tuzman] now claims that his expert has some limited experience with the GC/MS methodology – a disclosure he never made previously. . . . [Tuzman's] expert notice about the GS/MC methodology was one paragraph in total. Now, almost two months after his expert notice was due, the defendant has provided more details in his brief about what Dr. Lyter did – totaling approximately 20 pages.

(Id. at 2-3) (emphasis in original) The Government further objected to Tuzman's continuing "refus[al] to disclose 12 of his 21 GC/MS results – the majority of his testing." (Id. at 3)

On October 24, 2017, the Court issued an order granting the Government's motion to compel. (Dkt. No. 513) While the Court agreed with Tuzman that "Rule 16 does not require preparation of a report" (id. at 2 n.1), it rejected his argument that Rule 16(b)(1)(B) only

requires disclosure of results where an expert has prepared a report. (Id. at 4-6) The Court also rejected Tuzman's argument that the physical examination and Thin Layer Chromatography test "results" were not discoverable because they constitute "intermediate laboratory material." (Id. at 6-8) Accordingly, the Court ordered Tuzman to disclose the results of all GC/MS tests, and to disclose "any tangible results of the physical and Thin Layer Chromatography tests performed by Dr. Lyter that are relevant to his testimony." (Id. at 6, 8)

Because the Court concluded that Tuzman was required to disclose these results under Rule 16(b)(1)(B), the Court did not reach the question whether disclosure was also required under Rule 16(b)(1)(C) to supply the "bases and reasons" for Dr. Lyter's opinions. (Id. at 3 n.3) The Court noted, however, that a "disclosure stating only the results of a test and the fact that the results are 'inconsistent' with a given proposition, without further explanation, appears to run afoul of Rule 16(b)(1)(C)." (Id. at 2 n.2 (citation omitted)) Tuzman subsequently provided the Government with the results that are the subject of the October 24, 2017 order, including the GC/MS results for the twelve notebook pages that Dr. Lyter did not intend to reference in his testimony. (KIT Ex. 10000 at 77-123)

On October 27, 2017, this Court ruled that it would conduct a Daubert hearing concerning Dr. Lyter's testimony "[b]ecause of the belated disclosure of Dr. Lyter's test results, as well as the provision of further specifics concerning his methodology set forth in the briefing." (Tr. at 79) The Court also expressed "concern" about the absence of disclosures regarding the bases and reasons underlying Dr. Lyter's testimony. (Id. at 89; see also id. at 90 ("I think I've told everybody here that to the extent insufficient information has been provided to allow the adversary to understand the methodology and the basis for the conclusions that experts have reached, I am likely to take a dim view of admitting the expert's testimony."))

Prior to the November 20, 2017 Daubert hearing, the Government registered additional complaints concerning Tuzman's disclosures regarding Dr. Lyter's proposed testimony:

> We'd again request, since it's now been months, if the defense is going to actually call this man, we would like to know what he did. We've been sending almost interrogatories to them saying can you please explain . . . what is the R value percentage, how did you do the math. . . .
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> . . . We've been asking over and over and spending hours asking what did your expert do. They refuse to turn it over. Things are getting sort of leaked out as we ask for it, which isn't how discovery is supposed to work where we have to figure out what's missing.
>
> So if they want to proceed we again object because they haven't complied. But we want to know what he's going to say so I can prepare a cross and a direct of our expert.

(Id. at 2415-16)

Tuzman's counsel responded:

> My understanding is that everything we have and everything Dr. Lyter has has been provided. And just so I can lay that out. All of the data underlying his analysis, his conclusions has been produced. Not only that. He's not created a report. But we have disclosed the conclusions. We've provided every single spit out from the computer that show the graphs of what he analyzed, his handwritten analysis. They've come back to us and asked follow-up questions. We've responded. We've responded sometimes with the exact same information we previously provided because their follow-up questions didn't seem to apprehend some of the information we provided.

(Id. at 2417) Notwithstanding Tuzman's assertion that "nothing has been withheld and that [Dr. Lyter's] methodology is clear" (id. at 2419), on November 16, 2017 – four days before the scheduled Daubert hearing – Tuzman supplied an eight-page, single-spaced report prepared by Dr. Lyter, supported by 181 pages of exhibits.[4] (KIT Ex. 10004)

[4] Tuzman had previously provided the exhibits in piecemeal fashion, both before and after the Court's October 24, 2017 order granting the Government's motion to compel. (See KIT Ex. 10000)

III. THE NOVEMBER 20, 2017 *DAUBERT* HEARING

At the November 20, 2017 Daubert hearing, Dr. Lyter testified that "there are processes the ink undergoes when it is applied to paper from pen . . . [that] can be detected, number one; measured, number two; and correlated to a particular time period during which those changes would normally occur." (Tr. at 2798-99) According to Dr. Lyter, certain substances called "semi-volatiles" "volatilize or [] evaporate" due to "exposure to the environment" (id. at 2802), and SLRM analysis using GC/MS testing is used to "identify and quantitate the amount of [] semi-volatiles that are present" in ink. (Id. at 2844) The particular semi-volatile substance measured in ink-dating analysis is 2-phenoxyethanol ("PE"). (Id. at 2812, 2844)

Dr. Lyter further testified that the methodology he used to test the ink in the Smyth notebooks was based on two articles: the Gaudreau & Brazeau paper referenced above and a later paper by Gaudreau and Valery Aginsky (the "Gaudreau & Aginsky paper"). (See id. at 2846 (Lyter testimony that the Gaudreau & Brazeau paper was "one of" the articles he relied on to develop his methodology); id. at 2898 (Lyter testimony that he also relied on "a paper that was done by Gaudreau in conjunction with Aginsky"); id. at 2901 ("Those two articles are the only ones that I relied on as far as the basis for doing the testing, and the evaluation of the data that's generated from the testing."))

Dr. Lyter described generally the GC/MS and SLRM analysis he employed. First, the "GC part separates the components" of the ink and shows "peak[s] at [] particular time period[s]." (Id. at 2844) When a peak occurs at the "time period [that] is how long it normally takes for [PE] to come through the GC," analysis can "identif[y] a peak" that one can "think is [PE]." (Id.) Analysis "can confirm that it is [PE]" via "the mass spectrum," which reflects "a

series of ion peaks [that] is characteristic of [PE]." (Id.) After the presence of PE is identified, analysis can "determine how much of it is present by either measuring the peak height of the mass spectrum or by measuring the peak height or peak area of the chromatographic peak." (Id. at 2845)

The next step is to perform "various calculations" that "result in what is called the R percent," which is "the solvent loss ratio as a percentage value." (Id.) The R% "is calculated . . . by measuring the amount of [PE] that is in an ink sample . . . and comparing that to the amount of [PE] that is in a sample of ink that . . . was [] artificially aged in a[n] oven for two hours at 70 degrees centigrade." (Id.) "[T]he premise [] is that if there's not much [PE] there to begin with, heating is not going to change it much. But if there is a lot of [PE] there, and it's because the writing is very recent, then the heating will cause you to lose a lot of that [PE]." (Id.) Accordingly, "the loss ratio percent will be higher if the writing was newer." (Id.)

Dr. Lyter further testified that "the literature [] says [that] if the solvent loss ratio percent is 35 percent or greater, that means that the writing was done within two years of the examination date."[5] (Id.) "If the solvent loss ratio method is less than 35 percent," then one cannot determine specifically when the writing was done. (Id. at 2845-46) In sum, by "measuring the amount of [PE]," one is "able to perform the calculations, come up with the R percent values and determine whether or not the writing is of recent origin or older, but [not precisely] how old." (Id. at 2846)

Dr. Lyter then explained how he applied the GC/MS and SLRM methodology set forth in the two articles to his analysis of Smyth's notebook entries. Dr. Lyter testified that he

[5] Dr. Lyter testified that his "use of the 35 percent threshold" was based on the Gaudreau & Aginsky paper. (Id. at 2898-99)

began by taking pairs of samples "very close to each other" on a notebook page so that there was a "higher likelihood of those samples containing the same amount of ink." (Id. at 2848) According to Dr. Lyter, the articles he relies on state that this is the "best" method "to take samples from the particular document in question." (Id.; see also GX 3544 (Gaudreau & Aginsky paper) at 6 ("Each pair of microplugs of ink on paper . . . should be taken in very close proximity to each other[.]")) Dr. Lyter took four pairs of samples from each notebook entry he tested. (Tr. at 2849) Four samples from each notebook entry (one from each pair) were placed in a vial to be heated, while the other four samples (the other sample from each pair) were placed in a vial that was not heated. (Id. at 2849-50) The heated samples were "heated for two hours at 70 degrees centigrade." (Id. at 2850) Those vials were then numbered and transported to North Carolina State University, where Dr. Lyter conducted his GC/MS testing. (Id. at 2842, 2850)

At North Carolina State University, Dr. Lyter used a solution of acetonitrile to "extract the ink from the paper" in the vials. (Id. at 2850-51) Acetonitrile contains cresol, a chemical that is "added as an internal standard" or benchmark to quantify the amount of PE. (Id. at 2850-51) After extraction, Dr. Lyter "remove[d] one microliter" from each vial and injected it into the GC/MS instrument. (Id. at 2852) After the instrument produced graphical outputs, Dr. Lyter applied a formula to the peak heights on the mass spectrum graph to determine the R% values for individual samples. (Id. at 2856-59, 3026)

Based on his GC/MS testing and SLRM analysis, Dr. Lyter concluded as follows:

> I found eight different entries [for which] . . . the solvent loss ratio . . . was not consistent with writing done during the time period that the documents purportedly were prepared[,] and that . . . indicated the writing was done sometime within . . . two years from the date of the examinations[,] which were in March and April of 2017.

(Id. at 2814)[6]

Dr. Lyter testified that his conclusions carried a confidence rate of 95 percent. (Id. at 2888) Dr. Lyter explained that he drew his confidence level from "work done by Aginsky [that] reported that after doing an examination of so many ink formulas and different ink writings that when there was a value of heated versus unheated that provided threshold values of above a certain level, [] the confidence limit for that data was 95 percent." (Id. at 2955)

The Government called Gerald M. LaPorte at the Daubert hearing. LaPorte is the Director of the U.S. Department of Justice's Office of Investigative and Forensic Sciences at the National Institute of Justice. (Id. at 2975) LaPorte has published extensively on the subject of ink dating (id. at 2977), and Tuzman's law firm has retained LaPorte as an expert witness on ink dating "on at least four or five occasions." (Id.) During his testimony, Dr. Lyter conceded that LaPorte is one of "only a handful of us that do analysis of inks," and is "competent" with respect to the tests at issue. (Id. at 2910)

LaPorte testified that he was concerned that the notebook entries tested by Dr. Lyter were contaminated because they are part of a "book that has writing on the adjacent page," and "when you close the book, the adjacent page [] contaminates the other page because the ink is so tightly pressed in that book." (Id. at 2978) LaPorte also expressed concern that the notebook pages tested by Dr. Lyter might have been contaminated "if somebody [was] handling a document" while wearing "certain colognes and perfumes and other fragrances and creams [that] contain [PE]." (Id.) LaPorte also testified that the samples tested by Dr. Lyter were subject to a significant risk of contamination, because Dr. Lyter used a GC/MS instrument at

[6] Dr. Lyter testified that – between August 21, 2017, when Tuzman made his initial disclosures, and the November 20, 2017 Daubert hearing – his conclusion changed with respect to one of the entries because he had made an error in his R% calculations. (Tr. at 2875-76)

North Carolina State University that is used to test a wide variety of substances containing solvents, and not just ink. (Id. at 2979) Finally, LaPorte criticized the reliability of Dr. Lyter's methodology, particularly Dr. Lyter's "lack of quality control standards." (Id. at 2978)

DISCUSSION

I. LEGAL STANDARDS

A. Federal Rule of Criminal Procedure 16

Federal Rule of Criminal Procedure 16 requires a defendant to provide the Government "a written summary of any [expert] testimony that the defendant intends to use . . . as evidence at trial." Fed. R. Crim. P. 16(b)(1)(C). "This summary must describe the witness's opinions, the bases and reasons for those opinions, and the witness's qualifications." Id. The purpose of Rule 16 is to "'minimize surprise that often results from unexpected expert testimony, reduce the need for continuances, and to provide the opponent with a fair opportunity to test the merit of the expert's testimony through focused cross-examination.'" United States v. Ulbricht, 858 F.3d 71, 114 (2d Cir. 2017) (quoting Fed. R. Crim. P. 16, advisory committee's note to 1993 amendment). "If a party fails to comply with Rule 16, the district court has 'broad discretion in fashioning a remedy,' which may include granting a continuance or 'ordering the exclusion of evidence.'" Id. at 115 (quoting United States v. Lee, 834 F.3d 145, 158 (2d Cir. 2016)).

B. Federal Rule of Evidence 702

Whether expert testimony should be admitted is a matter committed to the trial judge's "broad discretion." Boucher v. U.S. Suzuki Motor Corp., 73 F.3d 18, 21 (2d Cir. 1996). Under Federal Rule of Evidence 702,

> [a] witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:
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> (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in

issue;

(b) the testimony is based on sufficient facts or data;

(c) the testimony is the product of reliable principles and methods; and

(d) the expert has reliably applied the principles and methods to the facts of the case.

Fed. R. Evid. 702.

In Daubert v. Merrell Dow Pharm., Inc., the Supreme Court instructed that Rule 702 imposes a "gatekeeping" responsibility on trial courts to "ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable." Daubert, 509 U.S. 579, 589 (1993). "Per Daubert and its progeny, a court's Rule 702 inquiry involves the assessment of three issues: (1) the qualifications of the expert, (2) the reliability of the methodology and underlying data employed by the expert, and (3) the relevance of that about which the expert intends to testify." Washington v. Kellwood Co., 105 F. Supp. 3d 293, 304 (S.D.N.Y. 2015) (citations omitted). The party seeking to rely on expert testimony bears the burden of establishing, by a preponderance of the evidence, that all requirements for admissibility have been met. United States v. Williams, 506 F.3d 151, 160 (2d Cir. 2007).

"[W]hether a purported expert is qualified under Rule 702 is an inquiry to be resolved prior to all others." Washington, 105 F. Supp. 3d at 304. "Whether a proposed expert has the requisite qualifications depends on his or her educational background, training, and experience in the field(s) relevant to the opinions he or she seeks to give." S.E.C. v. Tourre, 950 F. Supp. 2d 666, 674 (S.D.N.Y. 2013).

"[C]ourts in this circuit have noted that an expert should not be required to satisfy an overly narrow test of his own qualifications." Arista Records LLC v. Lime Grp. LLC, 2011 WL 1674796, at *3 (S.D.N.Y. May 2, 2011) (internal quotation marks and citations omitted); see

also In re Puda Coal Sec. Inc., Litig., 30 F. Supp. 3d 230, 250 (S.D.N.Y. 2014) ("In the Second Circuit, courts have construed the inquiry into an expert's qualifications with an eye towards the liberal thrust of the Federal Rules and their general approach of relaxing the traditional barriers to opinion testimony.") (internal quotation marks and citations omitted). "Thus, [i]f the expert has educational and experiential qualifications in a general field closely related to the subject matter in question, the court will not exclude the testimony solely on the ground that the witness lacks expertise in the specialized areas that are directly pertinent." Washington, 105 F. Supp. 3d at 305 (internal quotation marks and citations omitted); see also Pension Comm. of Univ. of Montreal Pension Plan v. Banc of Am. Sec., 691 F. Supp. 2d 448, 457 (S.D.N.Y. 2010) (noting that the Second Circuit has "allowed an expert to testify as to matters within his general expertise even though he lacked qualifications as to certain technical matters within that field.") (citing McCullock v. H.B. Fuller Co., 61 F.3d 1038, 1042-43 (2d Cir. 1995)); Yaccarino v. Motor Coach Indus., Inc., 2006 WL 5230033, at *9 (E.D.N.Y. Sept. 29, 2006) (district court "need not preclude an expert from testifying merely because he or she does not possess experience tailored to the precise product or process that is the subject matter of the dispute") (citing, inter alia, Stagl v. Delta Air Lines, Inc., 117 F.3d 76, 82 (2d Cir. 1997)).

In assessing reliability, "the district court must focus on the principles and methodology employed by the expert, without regard to the conclusions the expert has reached or the district court's belief as to the correctness of those conclusions." Amorgianos v. Nat'l R.R. Passenger Corp., 303 F.3d 256, 266 (2d Cir. 2002). In determining whether the expert's opinion is reliable, a trial court should consider, inter alia, "the theory's testability, the extent to which it 'has been subjected to peer review and publication,' the extent to which a technique is subject to 'standards controlling the technique's operation,' the 'known or potential rate of error,' and the

'degree of acceptance' within the 'relevant scientific community.'" United States v. Romano, 794 F.3d 317, 330 (2d Cir. 2015) (quoting Daubert, 509 U.S. at 593–94). The inquiry is a "flexible one," however, and there is no "definitive checklist or test" for determining the reliability of expert testimony. Id. (internal quotation marks and citations omitted).

Moreover, "[a] minor flaw in an expert's reasoning or a slight modification of an otherwise reliable method will not render an expert's opinion per se inadmissible." Amorgianos, 303 F.3d at 267. "The judge should only exclude the evidence if the flaw is large enough that the expert lacks good grounds for his or her conclusions." Id. (internal quotation marks and citations omitted). "As the Supreme Court has explained, '[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.'" Id. (quoting Daubert, 509 U.S. at 596). There must be "a sufficiently rigorous analytical connection between [the expert's] methodology and the expert's conclusions," however. Nimely v. City of New York, 414 F.3d 381, 396 (2d Cir. 2005). "[I]t is critical that an expert's analysis be reliable at every step." Amorgianos, 303 F.3d at 267. "[N]othing in either Daubert or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the ipse dixit of the expert." Gen. Elec. Co. v. Joiner, 522 U.S. 136, 146 (1997).

Finally, a trial court must consider whether the expert's testimony will assist the jury. "This inquiry looks primarily to whether the testimony is relevant." 523 IP LLC v. CureMD.Com, 48 F. Supp. 3d 600, 644 (S.D.N.Y. 2014) (citation omitted). "Evidence is relevant if: (a) it has any tendency to make a fact more or less probable than it would be without the evidence; and (b) the fact is of consequence in determining the action." Fed. R. Evid. 401.

C. Federal Rule of Evidence 403

Rule 403 provides that "[t]he court may exclude relevant evidence if its probative value is substantially outweighed by a danger of one or more of the following: unfair prejudice, confusing the issues, misleading the jury, undue delay, wasting time, or needlessly presenting cumulative evidence." Fed. R. Evid. 403. The Second Circuit has cautioned trial courts to consider "the uniquely important role that Rule 403 has to play in a district court's scrutiny of expert testimony, given the unique weight such evidence may have in a jury's deliberations." Nimely, 414 F.3d at 397 (citing Daubert, 509 U.S. at 595).

II. THE ADEQUACY OF TUZMAN'S EXPERT DISCLOSURE

A. Whether Tuzman's August 21, 2017 Disclosures Were Deficient

The Government argues that Dr. Lyter's testimony should be excluded because Tuzman's August 21, 2017 disclosures did not provide the bases and reasons underlying Dr. Lyter's opinion. (See Gov't Br. (Dkt. No. 572) at 3 ("[Tuzman's] disclosure from August 2017 was insufficient and did not satisfy his Rule 16 obligations."))

As an initial matter, this Court acknowledges that while "[t]he type of information that must be disclosed under [Rule 16(b)(1)(C)] is [] very clear[,] [t]he quantity and specificity required of the disclosure . . . is less so." United States v. Mehta, 236 F. Supp. 2d 150, 155 (D. Mass. 2002) (emphasis in original). Nonetheless, where a defendant's disclosure makes "no attempt at all to describe 'the bases and reasons'" for an expert's opinion, then the disclosure is deficient under Rule 16(b)(1)(C). United States v. Wilson, 493 F. Supp. 2d 484, 487 (E.D.N.Y. 2007). Moreover, a "general description of possible bases does not meet the requirements of Rule 16(b)(1)(C)." United States v. Sturman, 1998 WL 126066, at *1 (S.D.N.Y. Mar. 20, 1998).

Courts have also noted that "complex testimony will require more substantial disclosures." United States v. Ferguson, 2007 WL 4539646, at *2 (D. Conn. Dec. 14, 2007) (citing United States v. Jackson, 51 F.3d 646, 651 (7th Cir. 1995)); see also Jackson, 51 F.3d at 651 (indicating that Rule 16(a)(1)(E) – which requires the Government to supply the "bases and reasons" underlying its proposed expert testimony – "may require greater disclosure" in "cases involving technical or scientific evidence"); United States v. Wilkerson, 189 F.R.D. 14, 16 (D. Mass. 1999) (under Rule 16(a)(1)(E), "the extent of detail required . . . will depend on the nature of the expert testimony").

If proposed expert testimony is based on a "review and analysis of scientific, medical and other peer reviewed literature," the defendant must supply the literature upon which the expert will rely. United States v. Chase, 2005 WL 6733654, at *16-17 (D. Vt. Sept. 16, 2005). Similarly, "asserting that [an expert] will provide [an] opinion based on some unspecified method . . . , based on data from unspecified sources, does not suffice." United States v. Ulbricht, 2015 WL 413318, at *6 (S.D.N.Y. Feb. 1, 2015), aff'd, 858 F.3d 71 (2d Cir. 2017). Where a defendant supplies a "list of tests" that the expert performed or "other experts reports he had read," a failure to state what that expert concluded "from any individual test results . . . or expert report" renders disclosure insufficient. United States v. Day, 524 F.3d 1361, 1371-72 (D.C. Cir. 2008); see also Ferguson, 2007 WL 4539646, at *2 (disclosure about expert testimony that will rely on a certain "list of sources" is insufficient "[a]bsent information that links specific sources to each of the experts' opinions"). The disclosure must permit more than a simple "guess as to various opinions." Ulbricht, 2015 WL 413318, at *6.

Applying these principles here, Tuzman's August 21, 2017 disclosures concerning Dr. Lyter's GC/MS testing and SLRM analysis were plainly deficient. Tuzman's

disclosures reported that "Dr. Lyter will testify that research has established that levels of PE decrease with time after application of ball-pen ink to paper until a point of equilibrium is reached no later than 2 years after application of the ink to paper" (KIT Ex. 10003 at 5), but Tuzman did not identify the research upon which his opinion relied. Moreover, while Tuzman's disclosure discussed generally what GC/MS testing can show, how it is used, and when it is used (see id.), Tuzman did not disclose – aside from Dr. Lyter's use of the micro plug technique – what Dr. Lyter did (1) to prepare the samples for testing; (2) with the samples during testing, or (3) to ensure accuracy. See Ulbricht, 2015 WL 413318, at *6; Chase, 2005 WL 6733654, at *16-17. Tuzman's disclosures likewise did not reveal the data or quantitative basis upon which Dr. Lyter relied. It was not sufficient to disclose Dr. Lyter's baseline conclusions that certain results were "inconsistent" with preparation during the period of the alleged fraud; rather, Tuzman needed to disclose the formulas or calculations that Dr. Lyter used to reach his conclusions. See Day, 524 F.3d at 1371-72. In sum, because Tuzman's August 21, 2017 disclosures do not reveal the "bases and reasons" for Lyter's testimony, they do not comply with Rule 16(b)(1)(C).

B. Whether Preclusion Is Warranted

Although Tuzman's August 21, 2017 disclosures are deficient, preclusion of Dr. Lyter's testimony on this ground is not warranted. The Second Circuit has instructed that excluding a defendant's expert's is a "harsh sanction" that is "not be to be imposed lightly." Ulbricht, 858 F.3d at 117. Trial courts in this circuit have concluded that preclusion is generally not appropriate where a defendant's supplemental disclosures permit the Government to prepare a meaningful cross-examination. See, e.g., United States v. Ahmed, 2015 WL 1611947, at *2 (E.D.N.Y. Apr. 9, 2015).

Here, Tuzman did not produce Dr. Lyter's report until a few days before the Daubert hearing. While the Government complains about the late disclosures,[7] it has not argued that it could not adequately prepare its cross-examination of Dr. Lyter. Because the Government has not shown that Tuzman's deficient disclosures prevented it from conducting an appropriate cross-examination of Dr. Lyter, this Court will not preclude Dr. Lyter's testimony based on Tuzman's violation of Rule 16.

III. DR. LYTER'S QUALIFICATIONS

Dr. Lyter holds a bachelor of science degree in chemistry and biology from Oklahoma City University, a master of science degree in forensic science from George Washington University, and a Ph.D. in analytical chemistry from the University of North Carolina-Chapel Hill. (Tr. at 2796) Analytical chemistry is "a measurement science" that uses

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[7] For example, the Government asserts that

> Dr. Lyter testified for the first time at the Daubert hearing that he had not "adhere[d] exactly to the methodology" in Gaudreau & Brazeau, and that there had been "some" (generally unspecified) "slight variations." (Tr. 2899). But those "home brew" modifications were not reflected in any of the disclosures the defendant made to the Government – including in the 189-page report produced for the first time only four days before the hearing, or anywhere else. (Tr. 2899). Among the changes that Dr. Lyter admitted to making to the Gaudreau & Brazeau methodology was his reliance on a subsequent paper – Marc Gaudreau and Valery Aginsky, Essentials of the Solvent Loss Ratio Method (2010) ("Gaudreau & Aginsky"). Again, that change is not reflected anywhere in his report or prior disclosures. (Tr. 2899). It literally came up for the first time while Dr. Lyter was on the witness stand.

(Gov't Br. (Dkt. No. 572) at 7)

The Government introduced the Gaudreau & Aginsky paper as an exhibit during the Daubert hearing, however (see Tr. at 2940; GX 3544), and confronted Dr. Lyter with its contents. (See Tr. at 2941-42) Accordingly, the Government cannot argue that Dr. Lyter's reliance on this paper "introduce[d] a controversial expert opinion" that the Government was not prepared to rebut. Wilson, 493 F. Supp. at 488.

"the principles of chemistry" to take "measurements with various types of instruments to detect either the identity of a chemical or the state that the chemical is in and how it has changed." (Id.)

Dr. Lyter is a member of several professional organizations "relevant to the analysis of ink," including the American Chemical Society, the Mid-Atlantic Association of Forensic Scientists, the American Society for Testing and Materials, and the American Academy of Forensic Sciences, where he is a fellow in the Criminalistics Section. (Id. at 2803) He is also a member of the Southwestern Association of Forensic Document Examiners. (Id. at 2805) Dr. Lyter has published "[a]bout a dozen" papers in the field of forensic science (id. at 2894; see also KIT Ex. 10004 at 11), and he has presented his research at forensic science conferences. (KIT Ex. 10004 at 11)

Dr. Lyter has been a forensic chemist for more than forty years, and he specializes in analyzing documents. (Tr. at 2893) From January 1975 to September 1981, Dr. Lyter was employed as a forensic chemist at the Bureau of Alcohol, Tobacco, and Firearms. (KIT Ex. 10004 at 10) Since 1981, he has operated his own forensic examination firm – Federal Forensic Associates, Inc. – and "[e]ngaged in consultation, examination, training, research and testimony in Forensic Science, including ink and paper analysis." (Id.) Dr. Lyter has been retained by both private and governmental clients, including the Attorneys General of Pennsylvania and Ohio, the Federal Bureau of Indian Affairs, and various district attorneys in Pennsylvania and Virginia. (Tr. at 2797) He has also testified in court as an ink analysis expert more than 200 times. (Id. at 2809) Within the past five years, Dr. Lyter has been qualified as an ink analysis expert approximately 25 to 30 times. (Id.)

Dr. Lyter testified that he has performed SLRM analysis using GC/MS testing for approximately ten years. (Id. at 2892) While none of his publications concern SLRM analysis

using GC/MS testing (id. at 2894), in August 2017, Dr. Lyter presented research regarding SLRM analysis before the American Society of Questioned Document Examiners.[8] (Id. at 2805, 2807; see also Tuzman Opp., Ex. C. (Dkt. No. 575-3) at 37 (abstract summary of Dr. Lyter's presentation regarding "Artificial Aging and the Solvent Loss Method of Ink Dating")) Dr. Lyter has also offered expert testimony concerning SLRM analysis in three state court cases.[9] (See KIT Ex. 10004 at 14; Tr. at 2904, 2907) There was no Daubert hearing in any of these cases, however. (See Tr. at 2908)

The Government acknowledges Dr. Lyter's "extensive experience in other areas of the 'questioned document' field," but argues that Tuzman "has failed to show that Dr. Lyter is an expert in SLRM using GC/MS analysis." (Gov't Br. (Dkt. No. 572) at 5) Specifically, the Government argues that "the only evidence of Dr. Lyter's qualification as an expert in SLRM using GC/MS analysis is his trial-related 'work,'" and his "limited and self-taught litigation-related 'experience' is insufficient to qualify him as an expert in this highly specialized field." (Id. at 6) As discussed above, however, Dr. Lyter has presented research regarding SLRM analysis to the American Society of Questioned Document Examiners. (Tr. at 2805, 2807; see also Tuzman Opp., Ex. C. (Dkt. No. 575-3) at 37) Accordingly, his experience with SLRM

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[8] In 2007, Dr. Lyter made a presentation on GC/MS testing to the American Academy of Forensic Sciences (Tr. at 2807), although that presentation did not involve SLRM analysis. (Id. at 2896)

[9] Courts have, on occasion, excluded Dr. Lyter's expert reports and testimony for various reasons, including, as relevant here, because Dr. Lyter's methodology was not reliable and because he had failed to provide the bases and reasons for his opinions. See, e.g., Watts v. Cypress Hill, 2008 WL 697356, at *1-5 (N.D. Ill. Mar. 12, 2008) (striking Dr. Lyter's report "based on its incompleteness," including its failure to provide the "basis and reasons" for his opinions); Learning Curve Toys, L.P. v. Playwood Toys, Inc., 2000 WL 343205, at *1-4 (N.D. Ill. Mar. 31, 2000) (after Daubert hearing, precluding Dr. Lyter's testimony because it "failed to meet a legal standard of reliability necessary for the admission of expert testimony under Fed. R. Evid. 702").

analysis is not limited to the litigation context. In any event, while it is "preferabl[e]" that "the content of an expert's testimony will grow naturally and directly out of research [the expert has] conducted independent of the litigation, testimony based on research conducted solely for litigation is admissible as long as the expert employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field." In re Zyprexa Prods. Liab. Litig., 489 F. Supp. 2d 230, 284 (E.D.N.Y. 2007) (internal quotation marks and citations omitted).

The Government also complains that Dr. Lyter "has not received formal training in the testing at issue, has not written articles or given presentations [related to] the testing at issue, and [] has done no research relating to the testing at issue." (Gov't Br. (Dkt. No. 572) at 6) Dr. Lyter has performed SLRM analysis in the past, however, and has testified about his findings. He has given a presentation related to SLRM analysis to a professional society. Moreover, the Court "need not preclude an expert from testifying merely because he or she does not possess [extensive] experience tailored to the precise product or process that is the subject matter of the dispute." Yaccarino, 2006 WL 5230033, at *9 (citations omitted). Dr. Lyter has a doctorate in analytical chemistry, and has spent decades performing forensic examinations of ink and other substances containing chemicals. Dr. Lyter has also published papers in the field of forensic science, and the Government concedes that he has extensive experience in the general field of questioned documents. The Court concludes that Dr. Lyter has "educational and experiential qualifications in a general field closely related to the subject matter in question," and that he has sufficient experience with performing the SLRM analysis to satisfy the qualifications element under Rule 702. Washington, 105 F. Supp. 3d at 309 (internal quotation marks and citations omitted); see In re Zyprexa Prods. Liab. Litig., 489 F. Supp. 2d at 282 ("Assertions that

the [expert] witness lacks particular educational or other experiential background, 'go to the weight, not the admissibility, of [the] testimony.'") (quoting McCullock, 61 F.3d at 1044).

IV. THE RELIABILITY OF DR. LYTER'S TESTIMONY

The parties do not dispute that SLRM analysis using GC/MS testing is a generally accepted methodology for ink-dating. The Government argues, however, that Tuzman has "failed to show that Dr. Lyter carried out the SLRM using GC/MS analysis in a reliable manner." (Gov't Br. (Dkt. No. 572) at 6) According to the Government, Dr. Lyter's application of the SLRM analysis is unreliable because, inter alia, he did not use five basic quality controls: (1) testing paper blanks – pieces of the notebook paper that had no ink on them – to rule out cross-contamination; (2) using a GC/MS machine dedicated solely to ink analysis; (3) running multiple tests on a single page; (4) maintaining a written standard operating procedure with respect to his version of SLRM methodology; and (5) maintaining written records of his internal validation process. (Id. at 7-9, 11) Tuzman responds that "none of these concerns is sufficient to undermine the overall reliability of Dr. Lyter's testimony, leaving only arguments regarding the proper weight the jury should give Dr. Lyter's testimony." (Tuzman Opp. (Dkt. No. 575) at 32)

As discussed above, Dr. Lyter testified that the Gaudreau & Brazeau paper and the Gaudreau & Aginsky paper were "the only [articles] that [he] relied on as far as the basis for doing the testing, and the evaluation of the data that's generated from the testing." (Tr. at 2901) Both articles Dr. Lyter purportedly relied on state that paper blanks should be tested. The Gaudreau & Brazeau paper instructs that "[p]aper blanks are analysed as well to determine if there is any contamination." (See KIT Ex. 10000 at 23) The Gaudreau & Aginsky paper states:

> Paper blank samples
>
> One should bear in mind that a questioned Q entry or its portion might be contaminated by PE or other [ink volatile components] that came from another

> entry located close to the Q entry 1) either on the same or opposite side of the Q document, or 2) on another document that might have been in contact with the Q documents within a short period of time (e.g., within a few days) preceding the date of the examination of the Q document. Therefore, the analysis of paper background near that portion of the Q entry from which ink samples have been taken should be carried out to check this source of error.

(GX 3544 at 7)

Similarly, LaPorte testified that "[t]he first thing that any chemist would do, must do is [] run a paper blank." (Tr. at 2978)

With respect to using a GC/MS machine solely dedicated to ink analysis, the Gaudreau & Aginsky article states:

> The authors' experience shows that accurate quantitative results can only be obtained if the GC-MS system is devoted for ink analysis only. If it is also used for the analysis of other materials of forensic interest, for example, drugs of abuse, toxic substances, fire debris, and/or explosive residues, then the GC-MS system will be inevitably contaminated by these materials and products of their decomposition that will create numerous active sites in the sample flow path and thus will render reliable quantification for PE and the internal standard impossible.

(GX 3544 at 8) (emphasis added)

When asked if he used his GC/MS machine for anything other than ink dating, LaPorte answered, "absolutely not. . . . [A]s Gaudreau stated in the paper, whenever you're using your GC/MS for other materials, it can create all kinds of uncertainty, especially when you're doing quantitative analysis. So any kind of slight contamination can mess up the entire analysis." (Tr. at 2980-81)

With respect to running multiple tests, LaPorte testified:

> I try and do at least two samples per page. Ideally, as a chemist and as someone who has a background in statistics, I'd love to do three, four, or five. But there are practical concerns with that. So at least two.
>
> So if you do a test twice, then at least you can compare the values with each other and determine what your mean and what your variance is based on those two.

So that then becomes more accurate, reliable when you can do it that way.

(Id. at 2995)

LaPorte further testified that

> it's always necessary, this is a critical step, that you have an internal validation which means that you test samples of known ages, and you use the methodology. You record that data. You have that data on record, and then you know internally that you are – that the test is accurate and reliable as you apply it, not as somebody else who applied it.

(Id. at 2983)

LaPorte also testified that he utilizes "a written standard operating procedure." (Id. at 2984)

Dr. Lyter acknowledged that it is standard procedure in conducting a forensic examination of the type at issue here to perform testing on blanks to rule out cross-contamination. (Id. at 2929 ("Q. You would agree that it's standard procedure to perform testing on blanks in known testing in forensic labs that perform chemical testing, right? A. To a certain extent, yes. They're [] useful.")) As to testing on paper blanks specifically, Dr. Lyter testified that he was aware that the two articles he relied on instruct that paper blanks should be tested. (Id. at 2934) He testified, however, that while "it doesn't hurt" to test paper blanks, "[i]t's not necessary." (Id. at 2883) Dr. Lyter asserted that his "experience has been that the level of PE that's present [] in blank paper is extremely small and usually not present or not detectable," and that there was "nothing about [the notebooks that he tested] that indicated that [testing paper blanks] would be necessary." (Id.)

When confronted with the statement from the Gaudreau & Aginsky paper that "accurate quantitative results can only be obtained if the GC/MS machine is dedicated exclusively to ink analysis," Dr. Lyter simply stated that he did not find the article reliable on

that point. (Id. at 2941-2942 ("THE COURT: Are you saying that . . . you find the article unreliable on that point? THE WITNESS: Yes. That's correct."))

With respect to his failure to maintain a written standard operating procedure, Dr. Lyter testified that his procedure "[i]t's not written down, but I do it the same way all the time." (Id. at 2903-04)

Dr. Lyter also testified that he did not maintain copies of his validation tests, but that "[t]he data probably exists . . . on the instrumentation that [he] used, either the one at Duke or the one at N.C. State."[10] (Id. at 2907)

* * * *

The Court concludes that Dr. Lyter's failure to use basic quality control protocols – including those required in the two papers he purportedly relies on – demonstrates that he lacks "good grounds" for his conclusions. Amorgianos, 303 F.3d at 267-69 (upholding trial court's determination that proposed expert testimony was unreliable because expert witness "failed to apply his own methodology reliably"); see also In re Paoli R.R. Yard PCB Litig., 35 F.3d 717, 778 (3d Cir. 1994) (holding that "the district court acted within its discretion in excluding" an expert's testimony due to "quality control and methodological flaws" that "were so great as to undermine the data to the extent that it may not reasonably be relied on by experts in the relevant field").

Tuscumbia City Sch. Sys. v. Pharmacia Corp., 2015 WL 627960 (N.D. Ala. Feb. 12, 2015), is instructive. In that case, defendant moved to exclude the proposed testimony of two experts regarding tests they conducted for toxic chemicals known as Polychlorinated Biphenyls

[10] Given that Dr. Lyter testified that he performed the tests associated with this case at North Carolina State University (Tr. at 2150), the import of his reference to Duke University is not clear.

(PCBs). Id. at *1-2. Defendant contended that the testimony of the experts was unreliable "because they disregarded several quality controls mandated by their own laboratory." Id. at *3. The court concluded that the experts' failure to "follow four of [the laboratory's] six standard quality control protocols – protocols that also are required by the EPA for PCB testing – renders their findings unreliable." Id. In so holding, the court explained that the plaintiff "failed to demonstrate that [] testing [in the absence of these protocols] . . . has been subjected to peer review and publication, or is generally accepted by the relevant . . . community." Id. at *4 (internal quotation marks and citation omitted). The court also found that "the rate of error cannot effectively be determined because the analysts ignored most of the quality control protocols meant to ascertain the rate of error." Id.

Here, Dr. Lyter did not use a GC/MS machine dedicated exclusively to ink analysis, despite the clear instruction in one of the two articles on which he relies "that accurate quantitative results can only be obtained if the GC-MS system is devoted for ink analysis only." (GX 3544 (Gaudreau & Aginsky paper) at 8 (emphasis added)) He also did not test paper blanks, even though both papers on which he relies underscore the importance of performing tests on paper blanks to rule out contamination. These departures from the methodology on which Dr. Lyter purportedly relies demonstrate that his analysis is not "reliable at every step." Amorgianos, 303 F.3d at 267; Brown v. Burlington N. Santa Fe Ry. Co., 765 F.3d 765, 773 (7th Cir. 2014) ("[A]n expert must do more than just state that []he is applying a respected methodology; []he must follow through with it.").

Dr. Lyter has not provided any justification for these substantial deviations from the methodology he claims to have followed, other than his subjective belief that these quality control protocols are unnecessary. Precedent makes clear, however, that an expert is not free to

deviate – without justification – from the requirements of a methodology he claims to have followed. See Amorgianos, 303 F.3d at 267 (finding expert's conclusion that including certain data in his calculations was not "'necessary' . . . despite his stated opinion that a 'proper [] assessment' would take them into consideration," as "inexplicabl[e]"); Davis v. Carroll, 937 F. Supp. 2d 390, 416 (S.D.N.Y. 2013) ("The tension between [an expert's] insistence on adherence to established methodologies and his repeated admission of departures from those methodologies undercuts his credibility as a proponent of his method's reliability."); R.F.M.A.S., Inc. v. So, 748 F. Supp. 2d 244, 248 (S.D.N.Y. 2010) ("Expert testimony that is merely 'subjective belief or unsupported speculation' should be excluded.") (quoting Daubert, 509 U.S. at 590).

As to his failure to run multiple tests on each page at issue, Dr. Lyter provided no justification, other than to say, "time." (Tr. at 2945) Given that expert disclosure was required to be made in August 2017 (Dkt. No. 361), and that (1) Dr. Lyter's report was not produced until November 16, 2017; and (2) Dr. Lyter's testimony at the Daubert hearing did not take place until November 20, 2017, "time" is not an adequate explanation. See Wessmann v. Gittens, 160 F.3d 790, 805 (1st Cir. 1998) ("The only excuse that Dr. Trent proffered for his failure to follow proper protocols was that a thorough study would have required more time than he had available. That is unacceptable. An expert witness can only deviate from accepted methods of scientific inquiry in ways that are consistent with the practices and usages of the scientific community.") (internal citation omitted).

Likewise, Dr. Lyter's failure to maintain written records of his standard operating procedure and internal validation weigh against admissibility. See In re Mirena IUD Prods. Liab. Litig., 169 F. Supp. 3d 396, 443 (S.D.N.Y. 2016) ("[T]he fact that [the expert] did not have a written protocol prior to testing . . . weighs against admissibility."); Hall v. Bos. Sci. Corp.,

2015 WL 868907, at *12 (S.D.W.Va. Feb. 27, 2015) (citing expert's "failure to adhere to testing standards or a written protocol" in finding methodology unreliable); Tuscumbia City Sch. Sys., 2015 WL 627960, at *4 (in excluding expert, noting that expert "did not 'have any documentation'" on "how his 'method' of analysis was validated").

Tuzman argues, however, that Dr. Lyter employed other quality control protocols to ensure that his conclusions would be reliable, including (1) "ensur[ing] that the samples he took did not have ink on the reverse side of the page to avoid contamination"; (2) determining that the samples of ink on "separate pages exhibited virtually the same initial levels of PE, which . . . served as an internal control proving that the notebook paper was not contaminated or affecting the results in any way"; and (3) "flushing the system of all components associated with PE and the internal standard, cresol" by "allowing the [GC/MS] instrument to get up to 250 Celsius for over 16 minutes every time it was run." (Tuzman Opp. (Dkt. No. 575) at 33-34, 36)

Selecting samples that do not have ink on the reverse side of the page would not, however, eliminate the risk of contamination from another page in the notebook, an external source, or the GC/MS instrument itself. Moreover, Tuzman has not provided any support – aside from Dr. Lyter's testimony – for the claim that evidence that the notebook pages "contained approximately the same amount of PE in unheated samples . . . is a powerful indication that no external sources of PE contamination affected the notebooks." (Id. at 42-44) Finally, nothing in the articles Dr. Lyter purportedly relies on, or in any other scientific literature submitted to the Court, indicates that running the GC/MS instrument at 250 Celsius is sufficient to eliminate any risk of contamination, particularly in connection with an instrument that is used to test a wide variety of substances. Indeed, the unequivocal statement in the Gaudreau & Aginsky paper "that accurate quantitative results can only be obtained if the GC-MS system is devoted for ink

analysis only" (GX 3544 (Gaudreau & Aginsky paper) at 8 (emphasis added)), flatly contradicts Dr. Lyter's assertion that contamination risk can be eliminated simply by heating the GC/MS instrument.

Tuzman also argues that cleaning protocols employed at the North Carolina State University laboratory – where Dr. Lyter conducted his GC/MS testing – are sufficient to address the risk of contamination. (See Tuzman Opp. (Dkt. No. 575) at 36-37) Setting aside the fact that this assertion regarding cleaning is flatly contradicted by the Gaudreau & Aginsky paper Dr. Lyter purportedly relies on, Tuzman has not demonstrated that the instrument cleaning performed at North Carolina State is sufficient to eliminate contamination risk.

In connection with his argument regarding North Carolina State's cleaning protocols, Tuzman has submitted a declaration from Taufika Williams, the director of the North Carolina State laboratory. Williams states that

> [t]he GC/MS instrument at the North Carolina State University Mass Spectrometry Facility is routinely cleaned and maintained by staff at the Facility. The GC/MS instrument has an autotune feature that is run on the days of instrument usage by the user. In addition, the GC/MS instrument is cleaned and checked for contamination by Facility staff approximately every 100 sample runs. When Facility staff are alerted by users to possible contamination or dirtiness affecting the GC/MS instrument—for example, if chromatographs are of poor quality (e.g., displaying, shouldering, wide peaks, broad tails, etc.) – a full cleaning and decontamination of the GC/MS instrument is performed by Facility staff.
>
> The North Carolina State University Mass Spectrometry Facility has not received complaints of contamination or dirtiness affecting the results generated by the GC/MS instrument maintained at the Facility. Nor has the North Carolina State University Mass Spectrometry Facility received reports from users of significant error rates affecting the results generated by its GC/MS instruments.

(Williams Decl. (Dkt. No. 575-4) ¶¶ 5-6)

These protocols do not address the reliability concerns raised by Dr. Lyter's failure to follow the methodology of the research papers on which he purportedly relies,

however. According to the Gaudreau & Aginsky paper, "[i]f [the GC/MS instrument] is also used for the analysis of other materials of forensic interest . . . then the GC-MS system will be inevitably contaminated . . . and thus will render reliable quantification for PE and the internal standard impossible." (GX 3544 at 8 (emphasis added)) Cleaning and checking the GC/MS instrument after every 100 samples are tested, or when contamination is obvious to the naked eye or from clearly distorted chromatograph results, is not adequate to ensure that the samples Dr. Lyter tested were not contaminated. Moreover, the assertion that other users of the GC/MS instrument have not complained about contamination does not cast doubt on the Gaudreau & Aginsky article that Dr. Lyter purports to rely on, nor does it demonstrate that the samples Dr. Lyter tested were not contaminated.

The Court concludes that Dr. Lyter's failure to follow the methodology set forth in the two research papers on which he purports to rely renders his testimony unreliable. See Daubert, 509 at 593-94 (noting as one factor "the existence and maintenance of standards controlling the technique's operation"). Tuzman has likewise not demonstrated that Dr. Lyter's modification of the GC/MS and SLRM analysis set forth in the two research papers on which he purports to rely has been "subjected to peer review" or is "generally accepted" by the relevant scientific community. Id. at 593-94. The Court further finds that the rate of error cannot be accurately determined because Dr. Lyter ignored significant quality control protocols designed to cabin the rate of error. Id. at 594. Accordingly, Dr. Lyter's testimony is not sufficiently reliable for admission under Rule 702.[11]

[11] There is also evidence that Dr. Lyter's report misrepresents how the notebook pages he tested were selected. In his report, Dr. Lyter states that he "selected the handwritten entries from which to take samples without input or direction from anyone else, and based only on [his] knowledge of the case at the time" (KIT Ex. 10004 at 3). On cross-examination, however, Dr. Lyter conceded that this representation was false, and that Tuzman's lawyers directed him toward

V. FEDERAL RULE OF EVIDENCE 403

Even if Dr. Lyter's testimony was sufficiently reliable under Rule 702 to place before the jury, the Court would exclude his testimony because its probative value is substantially outweighed by the danger of unfair prejudice under Fed. R. Evid. 403. See Nimely, 414 F.3d at 397 (noting the "uniquely important role that Rule 403 has to play in a district court's scrutiny of expert testimony, given the unique weight such evidence may have in a jury's deliberations").

Given Dr. Lyter's failure to follow the quality control protocols set forth in the research papers on which he purports to rely, the probative value of his proposed testimony would be extremely limited. But the probative value of that testimony is even further limited by the nature of the defense here, the content of the notebook pages admitted into evidence, and the content of the Smyth notebooks more generally.

As an initial matter, Tuzman has conceded that round-tripping fraud occurred at KIT digital. During opening statements, defense counsel stated: "[T]he evidence will show [] that it was Mr. Smyth[] and Mr. Campion who sent and signed the sham licenses. . . . You will also see that it is Mr. Smyth[] who orchestrated the round-trip transactions." (Tr. at 152) Accordingly, it is undisputed that round-tripping fraud aimed at falsely inflating KIT digital's revenue took place at KIT digital. The only issue is whether Smyth and Campion engaged in this fraud on their own, or did so at Tuzman's direction. (See Tr. at 5455 ("THE COURT: . . . Now, as I understand it, the defense doesn't dispute that . . . there was round tripping going on at KIT

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certain pages. (Tr. at 2948 ("Q. So [Tuzman's counsel] picked the pages that you tested, correct? A. I guess they did.") This misrepresentation cases further doubt on Dr. Lyter's methodology. See Almeciga v. Ctr. for Investigative Reporting, Inc., 185 F. Supp. 3d 401, 426 (S.D.N.Y. 2016) (in excluding expert witness, noting the "striking contradictions between her Report and her in-court testimony").

digital and that Smyth specifically was engaged in round-tripping transactions. The point of dispute is whether he was doing this on his own or whether he was doing this in conjunction with Mr. Tuzman. MR. WEITZMAN: Correct, your Honor."))

The Smyth notebook pages admitted into evidence do not demonstrate that Tuzman directed Smyth and Campion's fraud, however, or that he had knowledge of it. For example, the notebook page marked as GX 2192-C lists various sham license agreements Smyth executed. This exhibit does not show that Tuzman knew that these license agreements were shams. Notebook pages marked as GX 2189-CR and GX 2190-AR were introduced only to demonstrate Smyth's state of mind. (Tr. at 2555, 2565; GX 2189-CR; GX 2190-AR) The pages marked as GX 2188-C, GX 2190-B, and GX 2190-C list fraud-related topics that Smyth testified he planned to discuss with Tuzman, but these pages do not prove that Smyth actually discussed these topics with Tuzman. The page marked as GX 2188-B contains Smyth's diagram of proposed fraudulent round-tripping transactions, but does not demonstrate or suggest that Smyth ever discussed this diagram with Tuzman.[12] In short, the Smyth notebook pages admitted into evidence provide little support for the Government's argument that Tuzman was a knowing participant in the accounting fraud.

Tuzman argues, however, that proof that Smyth "falsif[ied] evidence to inculpate [Tuzman]" is highly probative because "it's an entire indictment of the government's case resting on Mr. Smyth's testimony and evidence." (Tr. at 5459) The factual predicate for this argument, however, is that the Smyth notebooks actually contain evidence that inculpates

[12] As discussed above, Tuzman moved to preclude introduction of the "Kaleil Said Great Idea!" notation found on this page, and the Court granted Tuzman's application. (Tr. at 2215-16, 3506) In any event, Dr. Lyter did not test the ink used to make this notation (id. at 5462-63), and thus could not testify that it was not made contemporaneously with the fraud.

Tuzman in the charged accounting fraud. No such evidence has been introduced at trial, however, and no such evidence has been presented to the Court, with the exception of the "Great Idea" notation already excluded from evidence. If – as Tuzman argues – Smyth falsified entries in his notebooks in a belated effort to inculpate Tuzman, one would expect to see countless entries in the notebooks demonstrating Tuzman's involvement in and direction of the fraudulent round-tripping transactions and related accounting fraud. Although copies of the Smyth notebooks were produced to the defense many months ago (Tuzman Opp., Ex. A (Dkt. No. 575-1) at 2), no such evidence has been presented to the Court. Because Tuzman has not demonstrated that there is a factual basis for his claim that Smyth added material to his notebooks that inculpates Tuzman, the probative value of Dr. Lyter's proposed testimony is minimal. And given that defense counsel cross-examined Smyth for six days (Tr. at 2738-2781, 3053-3227, 3269-3298, 3321-3485, 3644-3707, 3727-3790), there clearly is no shortage of material already in the record from which to challenge his credibility.

As to the second step in the Rule 403 inquiry, the Court finds that the potential unfair prejudice flowing from the admission of Dr. Lyter's testimony is substantial given the Court's grave concerns with his methodology and the imprimatur of science that accompanies an expert witness such as Dr. Lyter. Introduction of Dr. Lyter's proposed testimony also presents a significant risk of jury confusion. Given that the jury has not seen evidence from the Smyth notebooks that incriminates Tuzman, the jury will likely struggle to understand defense arguments – premised on Dr. Lyter's testimony – that Smyth belatedly added notes to his notebooks that inculpate Tuzman.

Because the probative value of Dr. Lyter's proposed testimony is "substantially outweighed by a danger of . . . unfair prejudice," Dr. Lyter's testimony is likewise excluded under Fed. R. Evid. 403.

CONCLUSION

For the reasons stated above, the Government's motion to preclude the proffered expert testimony of Dr. Albert H. Lyter, III is granted.

Dated: New York, New York
December 18, 2017

SO ORDERED.

Paul G. Gardephe
United States District Judge